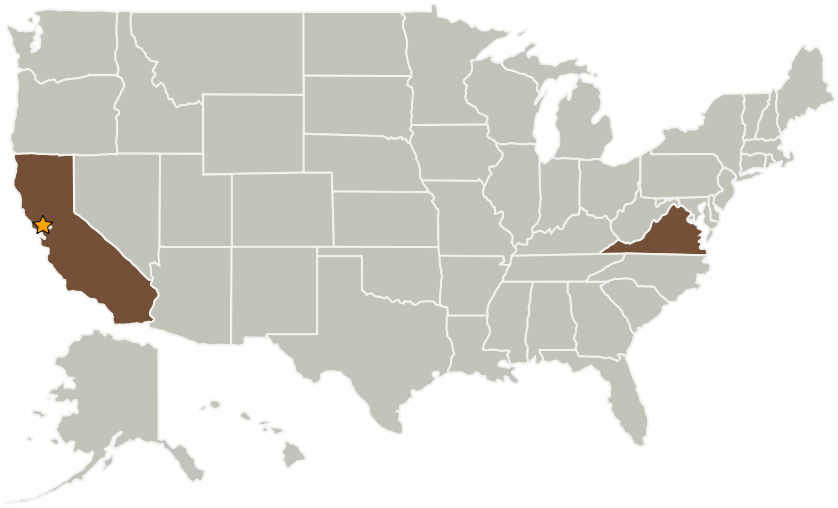
Murine Automated Urine Sampler (MAUS), Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

This proposal outlines planned development for a low-power, low-mass automated urine sample collection and preservation system for small mammals, capable of long-term operation in an isolated environment. It brings together earlier waste management and preservation techniques from NASA and other laboratory research in a novel manner, enabling solid-state storage and chromatographic analysis of urine for periods of up to 8 weeks. Urinary compounds, particularly those indicative of bone metabolism and protein turnover -- such as calcium, sodium, potassium, 3-methylhistidine, creatinine, corticosterone, histidine, n-telopeptide, hydroxyproline, pyridinoline, and deoxypyridinoline -- are one of the most valuable sources of data for studying musculoskeletal changes over time in response to altered stimuli, including loading environment. Since urine collection is non-invasive and provides a wealth of knowledge, including bone loss, muscle atrophy, and general stress, it is an ideal candidate for automated collection and storage. However, in common laboratory practice, urine samples must be collected, then frozen or analyzed within hours. The development of a urine collection and preservation system for common experimental small mammals will enable fundamental space biology research programs to substantially increase data gathered in the long-term studies planned for the International Space Station and other vehicles.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Aurora Flight Sciences Corporation	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joe Parrish

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.6 Ground Computing
    - TX11.6.2 Automated Exascale Software Development Toolset